Amendments to the Claims

This listing of claims will replace all prior versions and listings of the claims in this application.

Listing of Claims

- (Currently amended) A medical pump for use with a pumping chamber, comprising: a people people with the pumping adapted to intermittently pressurize the pumping chamber during a pumping cycle, the granning eyels distining an attempted that delivery study of the DEBRIC.
- a pressure sensor directly connected to the pressure exerted by the pressure exerted by the pressure the pressure of the press
- a position sensor operatively associated with the prompting of the position of the prompting element plantage throughout the paragraph of the
- a processing unit in electronic communication with the pressure sensor and position sensor; and
- a memory coupled to the processing unit, wherein the memory contains programming code executed by the processing unit to establish an expected manifed stock colonic, associated with the attempted fluid delivery stroke of the name, and afford stocke inventors based upwar at said obvious rate and the expected manifed stocke volume, there a strong a standard delivery stocke, process pressure data from the pressure sensor and position data from the position sensor to determine a calculated <u>petral</u> stroke volume of the pumping delivery stocke, and, if the calculated <u>actual attack volume is greater than a given lime hold value</u>, to release mendify the life it is stroke frequency of the spansy in a greater lime hold value, to release mendify the life it is stroke frequency of the spansy in a greater dark of the pumping of a greater than a stroke volume and each greater to compensate for variation between the calculated great stroke volume and each greater and another the calculated great stroke volume and each greater daring a massestment pursuence a vole; and
- wherein the pumping chamber has a passive outlet valve operated by the pressure exerted by the pressure exerted by the programming code executed by the processing unit processes pressure data from the pressure sensor to identify when the outlet valve has opened.

- (Original) The medical pump of claim 1, wherein the pressure sensor is the only pressure sensor included in the medical pump.
- 3. 8. (Cancelled)
- 9. (Currently amended) The medical pump of claim 1, wherein the programming code executed by the processing unit processes pressure data and position data to determine a calculated pressurization volume from a beginning of a compression stroke of the pumping cycle to the point when the outlet valve opens, and uses the calculated pressurization volume to determine the calculated satisfactors.
- 10. (Currently amended) The medical pump of claim 9, wherein the programming code executed by the processing unit determines a change in pressurization volume by subtracting the calculated pressurization volume from a nominal pressurization volume, determines a change in stroke volume by multiplying the change in pressurization volume by a ratio of pumping chamber expansion under pressure at the end of the compression stroke to pumping chamber expansion under pressure at the beginning of the compression stroke of the pumping cycle, and determines the calculated <a href="https://doi.org/10.1007/schange-in-stroke-volume-based-on-the-change-in-stroke-volume-based-on-th
- 11. (Original) The medical pump of claim 1 further comprising a cassette for defining the pumping chamber.
- 12. (Currently amended) The medical pump of claim 1, wherein the <u>nameting claushed in pressuring for a plurality of automated fluid skilvery sarekes and the calculated angual stroke volume is namenages taken once the plurality of alternated third delivery strokes comprises multiple and build delivery strokes comprises multiple and build delivery strokes.</u>

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13. - 22. (Cancelled)

- 23. (Currently amended) A medical pump for use with a pumping chamber, comprising a pumping chamber during a pumping cycle that pumping cycle t
- a pressure sensor <u>directly compected to the planted and</u> adapted to detect the pressure exerted by the <u>pressure states</u> that are not the pumping chamber.
- a position sensor operatively associated with the suscepting element dataset to detect the position of the susception elements have:
- a processing unit in electronic communication with the pressure sensor and position sensor;
- a memory coupled to the processing unit, wherein the memory contains programming code executed by the processing unit to catablesh as expected meanual stacks solution assessment which the attempted that delivers stocks of the pump, set a first stroke framener, based upon a desired desires rate and in expected pommed analysis volume, the next, sharing processing about the numerical density of the pumping shamber for at loss), are attempted fluid delivers attacks, process pressure data from the pressure sensor and position data from the position sensor to:
 - ion-a-ray due frequency for a desire k dosage onto based on a newtract stroke witnessidentify by a slope change in the pressure data when an outlet valve of the pumping chamber has opened,
 - determine a calculated pressurization volume from a beginning of the pumping cycle to the point when the outlet valve opens,
 - determine a change in pressurization volume by subtracting the calculated pressurization volume from a nominal pressurization volume,
 - determine a change in stroke volume by multiplying the change in pressurization volume by a ratio of pumping chamber expansion under pressure at the end of the compression stroke of the pumping cycle to pumping chamber expansion under pressure at the beginning of a compression stroke of the pumping cycle,
 - determine a calculated <u>actival</u> stroke volume based on the change in stroke volume, and if the calculated actual stroke volume is greater than a given threshold value.

subsequently, the stroke frequency to a second stoke in the new that is different than the first stroke frequency in order to compensate for variation between the calculated against stroke volume and the against a troke volume, and

- wherein the outlet valve of the pumping chamber is a passive valve operated by the pressure exerted by the pumping-chamber, on the pumping chamber.
- 24. (Original) The medical pump of claim 23 further comprising a cassette for defining the pumping chamber.
- 25. (Currently amended) A medical pump for use with a cassette having a pumping chamber, comprising:
- a possepsing observation in the partial of a seasonance with a shaft and adapted to intermittently pressurize the pumping chamber during a pumping cycle, the pumping axiele defining an attempted third delivery works of the pump.
- a pressure sensor directly counseded to the phanest and positioned in-line with the plunner between the manufact chanter and the shaft, the pressure censor being adapted to detect the pressure exerted by the pumping channestinginger on the pumping chanter; a position sensor operatively associated with the pumping-channestinginger to detect the
- a processing unit in electronic communication with the pressure sensor and position sensor; ,

position of the purpose element plumper;

a memory coupled to the processing unit to stablish in isspecial prominis programming code executed by the processing unit to stablish in isspecial prominist stable volume, associated with the attempted third delivery, attacks of the mains, set a first stroke frequency, based make a demond patient flow rate and the corrected membral streke colume, thence, during pressuazation of the pumping chamber for at least one attempted fluid delivery, stroke, to process pressure data from the pressure sensor and position data from the pumping cycle, and to edipose equalship the first stroke frequency of the pumping to a second stroke throughout our different than the first stroke frequency of the position of the pumping cycle, and to edipose equalship the first stroke frequency of the position of a second stroke throughout of the first stroke frequency of the position of the pumping to a second stroke throughout of the position of the pumping to a second stroke throughout of the position of the pumping to t

wherein the pumping chamber has a passive outlet valve operated by the pressure exerted by the pressure exerted by the pressure exerted by the processing the pumping chamber, and the programming code executed by the processing unit processes pressure data from the pressure sensor to identify when the outlet valve has opened.

26. - 30. (Cancelled)

31. (Currently amended) The medical pump of claim 10, wherein the Superstanding Information volume comprises multiple nominal pressurization volumes averaged together.